Ministry of Agriculture and Food
Ontario

ORDER NO. 90-156
JULY 1990
91-00854/ | AGDEX 555
Factsheet

MANAGEMENT OF DRAINED FIELDS

(Revision of Factsheet "Management of Drained Fields," June 1979)

Soil and Water Management Branch

This Factsheet contains basic ideas which will help ensure that you get the most value from your investment in land drainage.

PLANNING FOR A GOOD JOB

Find a reliable licensed contractor. He will tell you if he is able to plan the drain layout for you or if you should seek advice and a plan from an engineer. A plan made before the work begins is essential.

If you are planning a major field enlargement bear in mind two factors:

(a) Large fields, although convenient for machinery seldom dry uniformly.

(b) Long slopes on large fields can create very difficult erosion problems even if there is not much grade.

If possible, lay out the lateral drains at right angles to the way you work the field, otherwise dead furrows may not drain well. This is advantageous in working the field earlier in the year, (see pub. 73 *Handbook of Drainage Principles*, for recommendations on design).

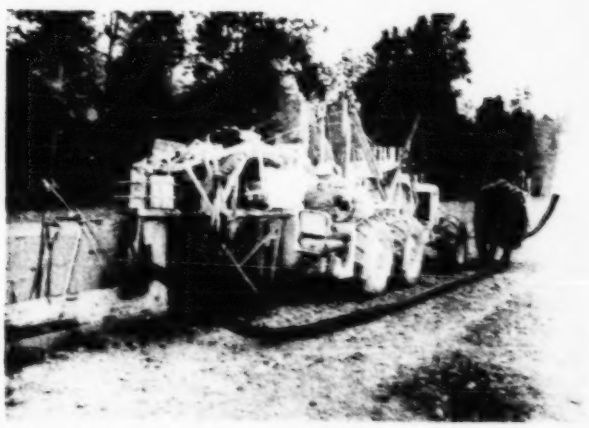

Figure 1. Ditching machine installing plastic pipe on a farm.

The contractor should use the proper size of main drain. It results in faster drying of the soil and fewer "blowouts." Don't let him design a system with too many outlets because of the cost of maintenance.

The location of the main drain, particularly if it is shallow, should be away from the headland area where it could be subject to loads from heavy equipment and loaded truck traffic.

A line of 100 mm diameter pipe is highly recommended as a header drain on the upper headlands where trafficability may be a problem.

Be sure to inform the contractor of any old drains or buried public utilities such as telephone cables or pipe lines. He will want to have these marked ahead of time for your legal protection.

The firmer and smoother the surface of the field, the better the chances of a good job. A field in sod provides a much firmer base for traction than if it were rough plowed or finely worked summer fallow. Sod is also less affected by medium and heavy rains in the summer so the work is done quickly.

Working conditions are best when air temperatures are around 20°C, the soil moist enough for easy digging and removal of stones, and the water table is below the trench bottom.

Quicksand, trench smearing and soil compaction are always less of a problem between June 15 and November 15.

Get the drain pipe well in advance. You may get a discount, but more importantly, it gives you a chance to examine it and reassure yourself on its quality. Pipe covered with polyester filter should not be stored outside longer than a month.

Drainage systems do not always provide the instant result you expected. They have to be encouraged through a good cropping plan, possibly subsoiling, retaining a surface drainage system, and just plain good care.

WATCHING THE WORK

Keep an eye on the work as it progresses. Note where the contractor seems to run into problems. If a major technical problem develops with the work which you feel is unsatisfactory and you cannot reslove it, call the provincial drainage inspector immediately at 519-767-3561.

Tile in the ground with no outlet is worse than no tile at all because of wet spots they cause at the low points of the tile. Usually, older tile systems are shallower and if they are clean can be hooked directly to the new system. Partially plugged systems should be connected to the new system by laying them parallel to it or by gravel backfill. Such a junction does not run the risk of damaging the new system.

In open trench installations make sure the pipes are covered with sufficient top soil blinding so they are not pushed out of line due to banks caving in or backfilling. Good blinding also cushions and protects the pipe from falling stones.

If you have agreed to backfill the trenches, be very careful. Earth dumped directly on a pipe will cause it to collapse. Move the dirt into the trench at an angle.

Check the following steps when inspecting the overall job for completeness before the contractor leaves the site:

(a) Are the drains where you wanted them?
(b) Are there other areas you should do now?
(c) Are you happy with the workmanship?
(d) Is the site cleaned up?
(e) Will you ask this same contractor to do other work at another time?
(f) Did you get your plan of drains?

IMMEDIATELY AFTER THE WORK

Improved drainage, by itself, will not produce the big crop yields you expect. You will also have to consider a different fertilizer program, choose the proper varieties or hybrids for your area and use a higher plant population. Work your land when it is fit, not when the neighbor works his.

After the system has been installed pickup the unused, broken or cut pipe and the stones. Fill in the ruts in the field and repair any fences that were cut.

When breaking up the sod after tiling it will be uneven and may be a mowing problem. Watch for old pipe and stones on the surface.

Make sure someone has prepared a map. Note on the drainage map the location of all drains and reference these to some permanent point so they can be located in the future. Show all the outlets and mark where there were installation problems.

If a drainage plow did your work never pack down the raised surface with a tractor wheel. Let the soil dry out and then disc it.

Don't cross freshly backfilled trenches with heavy equipment nor consolidate the backfill with the tractor wheel. The pipe will surely break or collapse.

Alfalfa and other soil building crops in a rotation certainly will do wonders to help the drainage of medium and fine textured soils. Consider it for your farm!

AFTER CARE

After care of a new drainage system consists of careful soil management and diligent maintenance of the drains.

It is not advisable to overwork your soil. If the surface is worked too fine it puddles and will not allow water to infiltrate into the subsoil. The object of good soil management is to keep damage to the soil structure to a minimum. Don't work the soil when wet, it only compacts, smears and reduces the flow of water to drains. Don't leave livestock too late in fall if it is wet, they also compact the soil surface.

The drain outlet(s) should be checked in early spring and in the fall. See if it has been washed out by a storm, suffered frost damage, or dislodged by ice, repair any erosion damage, make sure the rodent guard is in place and clean any sediment away so it has free outfall.

Quite a bit of sediment may come out of the system the first year. If it persists try to locate where the sediment is entering the system.

If wet spots show up in the field in the spring then there are likely old drains that were cut and not hooked into the new system. These should be connected now.

Wet spots persisting in low areas can often be helped by a short distance of gravel backfill. The trouble may also be the soil itself if it has lost its structure.

The efficiency of a drainage system is highly dependent on the soil. In some soils the drainage is immediate and continues at that level, in others the drainage is immediate but may slow down over 3 years as the soil consolidates, it may then slowly improve. In clays the drainage develops slowly as the soil develops new cracks, improved soil structure and water passages with time.

A good surface drainage system should always be used with every tile drainage system. Just because you installed tile you should not abandon the surface system. They work well together.

With care and good management, a well drained soil gives you the opportunity to produce sustained high yields of a wide variety of crops.

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ISSN 0225-7882